

REMARKS

Status of the Claims

In the present Office Action, the Examiner noted that the previous restriction requirement has been withdrawn.

In the present Office Action, the Examiner noted that no copy of the priority application was of record.

In the present Office Action, Figures 1-9 were objected to. Figures 1-8 were objected to as not including the legend "Prior Art", and as lacking reference characters. Figure 9 was objected to as erroneously including the text "Prior Art," and as lacking reference characters.

In the present Office Action, the Abstract of the invention was objected to.

In the present Office Action, the specification of the application was objected to as having the claims to priority in Paragraph 0009, not Paragraph 0001.

In the present Office Action, claims 3-4, 30, 32,35, and 45-46. These claims were objected to as having several informalities.

In the present Office Action, claims 7 and 30-50 were rejected under 35 U.S.C. § 112 as being indefinite or unclear.

In the present Office Action, claims 1-4, 7-10, 12-20, 23-24, 26-29, 51-54, and 56-57 were rejected under 35 U.S.C. § 103(a) as being obvious over Jurus in view of Evans.

In the present Office Action, claims 5-6, 21-22, 30-37, 40-48 were rejected under 35 U.S.C. § 103(a) as being obvious over Jurus in view of Evans and further in view of Ashley, Jr., et. al..

In the present Office Action, claims 11, 25, and 49 were rejected under 35 U.S.C. § 103(a) as being obvious over Jurus in view of Evans and further in view of Beyer.

In the present Office Action, claims 38-39 were rejected under 35 U.S.C. § 103(a) as being obvious over Jurus in view of Evans and further in view of Beyer.

Claims 4, 20, 27, 28, 42-44, 47-50, 53 and 54 are herein cancelled.

Argument

1.0 The Present Application

Claims 1-58 are presently pending in the present application, titled Wheels of Single Component Construction and Method of Making, which is directed towards a method of manufacturing a unitary steel wheel, equipment required therefore, and the resultant improved wheel. The application as pending comprises ten (10) independent claims, and 48 claims depending from those independent claims. Four (4) independent claims and nine (9) dependant claims are cancelled herein.

At the present, almost all commercially produced wheels are manufactured from several components, which are later joined to form a complete wheel assembly, which includes a center disk portion for mounting to the hub of a vehicle, and an outer rim portion, onto which a tire may be mounted. Wheels which form the center disk and the rim separately have issues regarding concentration of stresses resultant from the joining method, while wheels which use a multi-part rim section have not only stress concentration problems, but also sealing problems between the halves of the rings.

Prior art unitary wheels are limited, in that the shapes which could be formed were not practical with existing vehicles, or were formed out of materials such as aluminum, which do not share the strength and cost advantages of steel. Accordingly, the few attempts at the fabrication of unitary steel wheels have not been commercially successful.

The present invention utilizes a round steel blank which is spin formed to form a cylindrical section, which comprises the center disk and complete rim. The steel blank is provided with a center hole, the center of which forms the axis of rotation of the blank for the manufacturing operations. The blank is first spin formed to form a cylindrical preform, which is then further processed in a spin forming machine to form inner and outer bead seats and flanges on the cylindrical outer portion of the perform. Finally, additional features as required, such as mounting bolt holes and vent holes to allow air circulation, may be formed on the unitary wheel.

Jurus, U.S. Pat. No. 4,554,810, is directed towards a segment of a complete wheel. The segment includes part of the outer rim, as well as the center disk. Jurus does require, however,

that the second segment to complete the outer rim, be formed separately, and thus does not disclose a unitary wheel, or a method for forming one.

Evans U.S. Pat. No. 4,185,370 likewise does not disclose a unitary wheel, but rather only a method for forming the outer rim portion, leaving the center disk as a separate assembly.

Ashley Jr., et. al., U.S. Pat. No. 4,962,587 also does not disclose a unitary wheel, but rather a rim portion which would then have to be joined to a center disk.

Beyer U.S. Pat. No. 4,528,734 is thus the most relevant reference, as it does describe a unitary wheel, although the fabrication method is limited to the use of soft alloys, as a result of the reliance on forging to form the perform. The use of forging operations work hardens the material, as well as creates a second, significant limitation to the process of forming the wheel: as the preform is formed by forging, the center axis of the pre-form is not of necessity the same as the axis of the spin forming operation. Thus, not only can the resultant wheel have concentricity issues, spinning operations performed as a later part of the process may see large tool load variations resultant from the lack on concentricity. Thus, the formation of the pre-form through a forging process creates significant limitations, as opposed to the wheel of the present invention.

2.0 Response to Restriction Requirement

Applicant notes with appreciation the withdrawal of the previously issued Restriction Requirement.

3.0 Copy of Priority Application

In the present Office Action, the Examiner noted that no copy of the priority application was of record.

The present Application is a U.S. National Application filed under 35 U.S.C. § 371, and accordingly applicant believes that certified copies of the underlying Indian Applications are not required. Notwithstanding, Applicant requested certified copies for submission herewith, however only one copy of each reference was received. As copies of both priority documents have been made in this case, as well as Applicant's copending U.S. Patent Application Ser. No.

10/585,389, such that originals can only be filed in one case. Accordingly, photocopies of the certified priority documents are provided herein as Exhibit A, while the originals will be filed in U.S. Pat. App. Ser. No. 10/585,389, with certified original copies of the priority documents to be submitted in the present case upon receipt.

4.0 Correction of Drawings

In the present Office Action, Figures 1-9 were objected to. Figures 1-8 were objected to as not including the legend "Prior Art", and as lacking reference characters. Figure 9 was objected to as erroneously including the text "Prior Art," and as lacking reference characters.

Figures 1-9 all represent the prior art rim. Accordingly, the legend "Prior Art" has been added to Figures 1-8, however the legend associated with Figure 9 has not been removed.

With respect to reference characters, the prior art is described generally, such that reference characters are not believed required, as the steps are described in the specification in Paragraphs 00019 through 00027.

5.0 Correction of the Abstract

In the present Office Action, the Abstract of the invention was objected to. Applicant has revised the Abstract, and a substitute Abstract is submitted herewith.

6.0 Correction of the Priority Claim

In the present Office Action, the specification of the application was objected to as having the claims to priority in Paragraph 0009, not Paragraph 0001.

Paragraph 0009 has been moved to precede Paragraph 0001, and amended to properly reflect the present applications priority claim from PCT Application PCT/IN2005/000006, titled "Wheels of Unitary Construction and Method of Making Same," and accordingly the objection is believed overcome.

7.0 Correction of Informalities

In the present Office Action, claims 3-4, 30, 32, 35, and 45-46 were objected as having several informalities.

With respect to claims 3 and 4, an errant comma has been removed.

With respect to claim 30, Applicant has amended the claim to incorporate the Examiner's requested corrections.

With respect to claims 32 and 35, "perform" has been amended to read "perform", as correctly requested by the Examiner.

With respect to claims 45 and 46, Applicant has amended the claims to incorporate the Examiner's requested corrections

8.0 Rejections under 35 U.S.C. § 112

In the present Office Action, claims 7 and 30-50 were rejected under 35 U.S.C. § 112 as being indefinite or unclear.

Claim 7 was rejected as lacking antecedent basis for the limitation "outer flange portions." Claim 7 has been amended to address this issue.

Claim 30 has been amended to address the points raised by the Examiner with respect to "predetermined inner diameter", "the forward direction and "the backward direction," "formed in subsequent operations," and "well, inner & outer bead seats and inner & outer flanges." With respect to the forward direction and the backward direction, these are terms from the manufacturing process which are not believed to be necessary to the present invention, and accordingly have been deleted.

Claims 31 and 33-35 have been amended to address the phrase "the same" by referring to the structure as "the blank."

Claim 32 has been amended to address the rejection based on the term "the backward direction" and the phrase "outwardly positioned." As above, the phrase has been removed from the claim as it is not believed necessary to the present invention.

Claims 37-38 have been amended to address the phrase “conventional press.” As the Examiner noted, presses are well known, and the type of press used is irrelevant to the present invention.

Claim 45 has been amended to correct the double recitation of “a spinning machine.”

Claim 47 has been deleted.

9.0 Rejections under 35 U.S.C. § 102(a)

In the present Office Action, claims 1-4, 7-10, 12-20, 23-24, 26-29, 51-54, and 56-57 were rejected under 35 U.S.C. § 103(a) as being obvious over Jurus in view of Evans.

In the present Office Action, claims 5-6, 21-22, 30-37, 40-48 were rejected under 35 U.S.C. § 103(a) as being obvious over Jurus in view of Evans and further in view of Ashley, Jr., et. al.

In the present Office Action, claims 11, 25, and 49 were rejected under 35 U.S.C. § 103(a) as being obvious over Jurus in view of Evans and further in view of Beyer.

In the present Office Action, claims 38-39 were rejected under 35 U.S.C. § 103(a) as being obvious over Jurus in view of Evans and further in view of Beyer.

Claims 1, 15, 30, 45, 46, and 51 are the presently remaining independent claims. Accordingly, the inadequacy of the present obviousness rejections is made with respect to these claims, such that the dependant claims, by incorporating the limitations of the independent claims, are logically non-obvious as well.

9.1 Claim 1 is not Obvious over the Cited Reference

As noted above, neither Jurus nor Evans discloses a unitary wheel, and thus the combination of Jurus and Evans cannot render the present claim 1 obvious, as there is not only no teaching, but likewise no suggestion or motivation to combine the references to arrive at the present invention.

The addition of Ashley likewise is unavailing, since this reference also teaches a multi-part wheel, and thus the addition of Ashley to Jurus and Evans likewise cannot render claim 1 unpatentable.

The combination of Jurus and Beyer would seem to suggest the present invention, however this would be an erroneous conclusion. The method of Jurus is clearly incapable of forming a complete unitary wheel (i.e., a wheel having the necessary bead seats and flanges) through a spin forming process, as shown by its reliance on a multi-part wheel. Beyer, while the end result is a unitary wheel, imposes significant limitations as a result of the method devised (i.e., the use of forging to create the pre-form), and the limitation that the method rely on the use of soft alloys. Thus, the combination does not teach the formation of a unitary steel wheel formed completely by a spin forming process, nor does it suggest the process and resultant wheel of the present invention, as Beyer teaches away from the present invention (i.e., limiting use of the process to soft alloys, resultant from the problems that would be created through forging the pre-form from a hard alloy, such as steel.) Thus, not only does the combination of Jurus and Evans not render claim 1 unpatentable as obvious, neither does the combination of Jurus and Beyer, and claim 1 is not shown unpatentable.

9.2 Claim 15 is not Obvious over the Cited Reference

As noted above, neither Jurus nor Evans discloses a unitary wheel, and thus the combination of Jurus and Evans cannot render the present claim 15 obvious, as there is not only no teaching, but likewise no suggestion or motivation to combine the references to arrive at the present invention.

The addition of Ashley likewise is unavailing, since this reference also teaches a multi-part wheel, and thus the addition of Ashley to Jurus and Evans likewise cannot render claim 15 unpatentable.

The combination of Jurus and Beyer would seem to suggest the present invention, however this would be an erroneous conclusion. The method of Jurus is clearly incapable of forming a complete unitary wheel (i.e., a wheel having the necessary bead seats and flanges) through a spin forming process, as shown by its reliance on a multi-part wheel. Beyer, while the end result is a unitary wheel, imposes significant limitations as a result of the use of the forging method (i.e., the use of forging to create the pre-form), and the limitation that the method thus rely on the use of soft alloys. Thus, the combination does not teach the present method of forming a unitary wheel completely by a spin forming process, as Beyer clearly teaches away

from the present method (i.e., limiting use of the process to soft alloys, resultant from the problems that would be created through forging the pre-form from a hard alloy, such as steel.) Thus, not only does the combination of Jurus and Evans not render claim 15 unpatentable as obvious, neither does the combination of Jurus and Beyer, and claim 15 is not shown unpatentable.

9.3 Claim 30 is not Obvious over the Cited Reference

As noted above, neither Jurus nor Evans discloses a unitary wheel, and thus the combination of Jurus and Evans cannot render the present claim 30 obvious, as there is not only no teaching, but likewise no suggestion or motivation to combine the references to arrive at the present invention. The addition of Ashley likewise is unavailing, since this reference also teaches a multi-part wheel, and thus the addition of Ashley to Jurus and Evans likewise cannot render claim 30 unpatentable. It is clear that none of these references teach a unitary wheel manufactured by spin forming both a complete rim and center disk.

The combination of Jurus and Beyer would seem to suggest the present invention, however this would be an erroneous conclusion. The method of Jurus is clearly incapable of forming a complete unitary wheel (i.e., a wheel having the necessary bead seats and flanges) through a spin forming process, as shown by its reliance on a multi-part wheel. Beyer, while the end result is a unitary wheel, imposes significant limitations as a result of the use of the forging method (i.e., the use of forging to create the pre-form), and the limitation that the method thus rely on the use of soft alloys. Thus, the combination does not teach the present method of forming a unitary wheel completely by a spin forming process, as Beyer clearly teaches away from the present method (i.e., limiting use of the process to soft alloys, resultant from the problems that would be created through forging the pre-form from a hard alloy, such as steel.) Thus, not only does the combination of Jurus and Evans not render claim 30 unpatentable as obvious, neither does the combination of Jurus and Beyer, and claim 30 is not shown unpatentable.

9.4 Claim 45 is not Obvious over the Cited Reference

As noted above, neither Jurus nor Evans discloses a unitary wheel, and thus the combination of Jurus and Evans cannot render the present claim 45 obvious, as there is not only no teaching, but likewise no suggestion or motivation to combine the references to arrive at the present invention. The invention as claimed in claim 45 comprises an apparatus for making the wheel of the claimed invention, and there is no showing that Jurus discloses a wheel forming apparatus capable of spin forming not only the center disk but the complete rim as a unitary assembly. The addition of Ashley likewise is unavailing, since this reference also teaches a multi-part wheel, and thus the addition of Ashley to Jurus and Evans likewise cannot render claim 45 unpatentable. It is clear that none of these references teach an apparatus to form a unitary wheel manufactured by spin forming both a complete rim and center disk.

The combination of Jurus and Beyer would seem to suggest the present invention, however this would be an erroneous conclusion. The method of Jurus is clearly incapable of forming a complete unitary wheel (i.e., a wheel having the necessary bead seats and flanges) through a spin forming process, as shown by its reliance on a multi-part wheel. Beyer, while the end result is a unitary wheel, imposes significant limitations as a result of the use of the forging method (i.e., the use of forging to create the pre-form), and the limitation that the method thus rely on the use of soft alloys. Thus, Beyer does not teach an apparatus for forming a unitary wheel, in which not only is the rim spin formed, but the center sections is as well, while allowing the use of steel as the material for construction. Thus, the combination does not teach the present apparatus for forming a unitary wheel completely by a spin forming process, as Beyer clearly teaches away from the present method (i.e., limiting use of the process to soft alloys, resultant from the problems that would be created through forging the pre-form from a hard alloy, such as steel.) Thus, not only does the combination of Jurus and Evans not render claim 45 unpatentable as obvious, neither does the combination of Jurus and Beyer, and claim 45 is not shown unpatentable.

9.5 Claim 46 is not Obvious over the Cited Reference

Claim 46 is a product by process claim, incorporating the limitations of claim 30. While it is debatable whether this is truly an independent claim, the claim expressly includes limitations, which are clearly not taught by the asserted references. As noted above, neither Jurus nor Evans discloses a unitary wheel, and thus the combination of Jurus and Evans cannot render the present claim 46 obvious, as there is not only no teaching, but likewise no suggestion or motivation to combine the references to arrive at or enable the present invention, i.e. a unitary wheel. The addition of Ashley likewise is unavailing, since this reference also teaches a multi-part wheel, and thus the addition of Ashley to Jurus and Evans likewise cannot render claim 46 unpatentable. It is clear that none of these references teach a unitary wheel manufactured by spin forming both a complete rim and center disk.

The combination of Jurus and Beyer would seem to suggest the present invention, however this would be an erroneous conclusion. The method of Jurus is clearly incapable of forming a complete unitary wheel (i.e., a wheel having the necessary bead seats and flanges) through a spin forming process, as shown by its reliance on a multi-part wheel. Beyer, while the end result is a unitary wheel, imposes significant limitations as a result of the use of the forging method (i.e., the use of forging to create the pre-form), and the limitation that the method thus rely on the use of soft alloys. Thus, the combination does not teach the present method of forming a unitary wheel completely by a spin forming process, as Beyer clearly teaches away from the present method (i.e., limiting use of the process to soft alloys, resultant from the problems that would be created through forging the pre-form from a hard alloy, such as steel.) Thus, not only does the combination of Jurus and Evans not render claim 46 unpatentable as obvious, neither does the combination of Jurus and Beyer, and claim 46 is not shown unpatentable.

9.6**Claim 51 is not Obvious over the Cited Reference**

Claim 51 is an apparatus claim, directed towards the apparatus which forms a complete unitary wheel by spin forming, able to form the entire wheel, without falling back to a forging process to form an initial cylindrical pre-form. At a minimum, as Jurus does not disclose a unitary wheel, the disclosure of Jurus cannot teach the present apparatus which requires the presence of a forming component for forming a unitary steel wheel having inner and outer bead seats. Evans as well does not teach a unitary wheel, and thus the combination of Jurus and Evans cannot render the present claim 51 obvious, as there is not only no teaching, but likewise no suggestion or motivation to combine the references to arrive at or enable the present invention, i.e. a unitary wheel. The addition of Ashley likewise is unavailing, since this reference also teaches a multi-part wheel, and thus the addition of Ashley to Jurus and Evans likewise cannot render claim 51 unpatentable.

The combination of Jurus and Beyer would seem to suggest the invention of claim 51, however this would be an erroneous conclusion. The apparatus of Jurus is clearly incapable of forming a complete unitary wheel (i.e., a wheel having the necessary bead seats and flanges) through a spin forming process, as shown by its reliance on a multi-part wheel. Beyer, while the end result is a unitary wheel, imposes significant limitations as a result of the use of the forging method (i.e., the use of forging to create the pre-form), and the limitation that the method thus rely on the use of soft alloys. An argument alleging that combining the machinery of Beyer for forming the complete rim, with the portion of the machinery used by Jurus for spin forming the center disk, would be inapt. Beyer clearly teaches away from the use of spin-forming to form the pre-form, as it limits itself to the use of soft alloys, rather than the preferred steel, thus clearly teaching that an apparatus for forming a unitary steel wheel was not present or suggested by the disclosure. Thus, the combination does not teach the present apparatus for forming a unitary wheel completely by a spin forming process, as Beyer clearly teaches away from the present method (i.e., limiting use of the process to soft alloys, resultant from the problems that would be created through forging the pre-form from a hard alloy, such as steel.) Thus, not only does the combination of Jurus and Evans not render claim 51 unpatentable as obvious, neither does the combination of Jurus and Beyer, and claim 51 is not shown unpatentable.

9.7. Independent Claims 47-50

Independent claims 47-50 have been herein cancelled, and accordingly the obviousness rejections regarding these claims are moot.

9.7 Obviousness Under 35 U.S.C. §103 with respect to the Dependant Claims

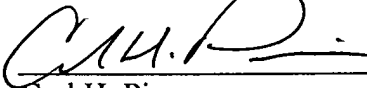
As noted above, each of the remaining claims depend from an allowable independent claim, and accordingly each dependent claim includes the limitations of the independent claim which are the basis for the patentability of the present invention as claimed. Accordingly, each of the dependant claims are likewise patentable.

10.0 Conclusion

Based upon the above remarks, Applicant respectfully requests reconsideration and withdrawal of this restriction requirement and early allowance of the pending claims. Should the Examiner feel that a telephone conference with Applicant's attorney would expedite prosecution of this application, the Examiner is urged to contact the undersigned attorney.

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EXHIBIT A